

Patent Claims

1. A lockup clutch (1) for hydrodynamic components (2), comprising at least one primary wheel (4) and one secondary wheel (5), which define a working chamber (6);
characterized by the following features:
 - 1.1 with two inputs (26, 27) – a first input (26) linked to the secondary wheel (5) and a second input (27) linked to the primary wheel (4) – whereby the inputs (26, 27) can be optionally linked via a switchable coupling device, comprising at least one switchable clutch (18), to an output (28) of the lockup clutch (1), thereby forming a first or a second power branch (32, 33);
 - 1.1⁵ the coupling between the input (27) of the lockup clutch (1) that is coupled to the primary wheel (4) and the output (28) of the lockup clutch (1) in order to create the second power pathway (33) is free of any rotationally fixed mechanical connection between primary wheel (4) and secondary wheel (5);
 - 1.2 the coupling between the inputs (26, 27) of the lockup clutch (1) and the output (30) of the lockup clutch (1) in the individual power branches (31, 33) is provided with rpm/torque converting devices.
 2. The lockup clutch (1) according to claim 1, further characterized in that the switchable coupling device comprises a clutch (18) that can be jointly used with both power branches (32, 33), that is, in the connections between the individual inputs (26, 27) and the output of the lockup clutch, or comprises at least one switchable clutch that is associated separately with each power branch (32, 33).
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3. The lockup clutch (1) according to claim 1 or 2, further characterized in that the switchable clutch (18) is designed as a positive locking synchronously switchable coupling.
4. The lockup clutch (1) according to claim 3, further characterized in that the switchable clutch (18) is designed as a claw clutch.
5. The lockup clutch (1) according to one of claims 1 to 4, further characterized by the following features:
 - 5.1 the rpm/torque converting devices in the individual power branches (32, 33) each comprise one back gear – a first back gear (7), which is linked to the secondary wheel (5) in a rotationally fixed manner, and a second back gear (8), which is linked to the primary wheel (4) in a rotationally fixed manner;
 - 5.2 arranged between the first and the second back gears (7, 8) is the switchable clutch (18) for selective coupling of the first back gear (7) or of the second back gear (8) to the back-gear shaft (10) coupled to the output (30).
6. The lockup clutch (1) according to claim 5, further characterized in that the first and second back gears (7, 8) are arranged coaxially and parallel to each other.
7. The lockup clutch according to claim 5 or 6, further characterized in that the output of the lockup clutch (1) is formed by the back-gear shaft (10) coupled to the outputs of the first and second back gears.
8. The lockup clutch (1) according to claim 5 or 6, further characterized in that the outputs of the first and second back gears (7, 8) can be coupled via at least one additional third back gear (9) to the output of the lockup clutch (1).

9. The lockup clutch (1) according to claim 8, further characterized in that one additional second switchable clutch (13) is provided, which is associated with the third back gear (9) and selectively links the third back gear (9) to the back-gear shaft (10).
10. The lockup clutch (1) according to one of claims 5 to 9, further characterized in that the first back gear (7) and the second back gear (8) have the same gear ratio.
11. The lockup clutch (1) according to claim 10, further characterized in that the first and the second back gears (7, 8) each have a gear ratio of 1 : 1.
12. The lockup clutch (1) according to one of claims 5 to 10, further characterized in that the first back gear (7) and the second back gear (8) have a different gear ratio, the gear ratio of the second back gear (8) being characterized in that it is changed by the amount of the slip of the hydrodynamic component at a desired lockup in relation to the first back gear (7).
13. The lockup clutch (1) according to one of claims 5 to 12, further characterized in that the individual back gears (7, 8, 9) are each designed as spur gear sets (11, 12, 13).
14. The lockup clutch (1) according to one of claims 8 to 13, further characterized in that a third switchable clutch (24) is provided, which directly links the input of the lockup clutch (1), coupled to the primary wheel, to the output of the lockup clutch, said clutch arranged, for example, between the second (8) and the third (9) back gears and at least selectively linking the second (8) to the third back gear (9) in a

rotationally fixed manner or else releasing this connection.

15. The lockup clutch (1) according to one of claims 1 to 14, further characterized in that the switchable clutches (23, 24) are designed as positive locking, synchronously switchable couplings.
16. The lockup clutch (1) according to claim 15, further characterized in that the positive locking clutch is designed as a claw clutch.
17. The lockup clutch (1) according to one of claims 1 to 14, further characterized in that all switchable clutches (18, 23, 24) are designed as force-activated clutches.
18. The lockup clutch (1) according to one of claims 1 to 17, further characterized in that the hydrodynamic component (2), in particular the secondary wheel (5), is associated with a braking device (22), which serves to fix in place the secondary wheel (5).
19. The lockup clutch (1) according to one of claims 1 to 18 for a hydrodynamic component (2) is designed in the form of a hydrodynamic clutch (3) that is free of a guide wheel.
20. The lockup clutch (1) according to one of claims 1 to 18 for a hydrodynamic component (2) that is designed as a hydrodynamic rpm/torque converter.
21. The lockup clutch (1) according to one of claims 1 to 20, further characterized in that a free wheel (F) is arranged between secondary wheel (5) and input (26) of the lockup clutch (1).
22. A subassembly (25)
 - 22.1 with a hydrodynamic component (2)
 - 22.2 with a lockup clutch (1) according to one of claims 1 to 21.